

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An observation optical device with a photographing function, having an observation optical system and a photographing optical system, said observation optical system being utilized as a focusing device for said photographing optical system, said observation optical device comprising:

a first focusing mechanism that focuses said observation optical system so as to observe a close-range view through said observation optical system;

a second focusing mechanism that focuses said photographing optical system so as to photograph a close-range view through said photographing optical system;

an association mechanism that associates said first and second focusing mechanisms with each other in such a manner that said observation optical system and said photographing optical system are always kept in a focused state; and

a reticle provided in said observation optical system for focusing said observation optical system with a predetermined dioptric power during an operation of said association mechanism;

said second focusing mechanism being constructed in such a manner that the photographing optical system is positioned at an object side, in relation to a theoretical position determined when the photographing optical system focuses on an object, when said observation optical system focuses on the object, wherein:

a measured dioptric power difference between a first dioptric power of a combination of an eye of the user and an ocular lens system of said observation optical system, focusing on said reticle,

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and a second dioptric power of a combination of the eye and said ocular lens system and an objective lens system of said observation optical system, focusing on an object to be observed, is cancelled;
and

the theoretical position is defined as a position of said photographic optical system such that, when an image observed through said observation optical system is focused on said reticle, the image obtained by said photographic optical system is also focused.

2. (Original) An observation optical device according to claim 1, wherein said measured dioptric power difference is obtained as an arithmetic mean of measured dioptric power differences obtained from experiments conducted on a plurality of observers.

3. (Original) An observation optical device according to claim 1, wherein said association mechanism comprises a rotary wheel member having a manually operated rotary wheel; said observation optical system comprises two optical system elements that are movable along the optical axis of said observation optical system to focus said observation optical system; said first focusing mechanism forms a first movement-conversion mechanism for converting a rotational movement said rotary wheel member into a relative back-and-forth movement of said two optical system elements; said photographing optical system is movable relative to an imaging plane along the optical axis of said photographing optical system to focus said photographing optical system; and said second focusing mechanism forms a second movement-conversion mechanism for converting a rotational movement of said rotary wheel member into a back-and-forth movement of said photographing optical system elements relative to said imaging plane.

4. (Original) An observation optical device according to claim 3, wherein said rotary wheel

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member comprises a rotary wheel cylinder in which a lens barrel is housed so as to be movable along the central axis of said rotary wheel cylinder; said photographing optical system is housed in said lens barrel; said second movement-conversion mechanism comprises a first cam groove formed in one of said rotary wheel cylinder and said lens barrel, and a first cam follower formed in the other of said rotary wheel cylinder and said lens barrel; and said first cam groove is formed in such a manner that a rotational movement of said rotary wheel cylinder is converted into a back-and-forth movement of said lens barrel along the central axis of said rotary wheel cylinder, and said measured dioptric power difference is cancelled.

5. (Original) An observation optical device according to claim 4, wherein said first movement-conversion mechanism comprises a second cam groove formed on an outer surface of said rotary wheel cylinder, an annular member that has a second cam follower engaged with said first cam groove and that is attached on an outer surface of said rotary wheel cylinder to move along the central axis of said rotary wheel cylinder, and a movement transmission mechanism that transmits the movement of said annular member to one of said two optical system elements of said observation optical system.

6. (Original) An observation optical device according to claim 3, wherein said observation optical system forms a pair, so that said observation optical device functions as a binocular telescope with a photographing function.

7. (Original) An observation optical device according to claim 6, wherein said pair of observation optical systems are mounted on an optical system mount plate that comprises first and second plates that are movable relative to each other, one of said pair of observation optical systems

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is placed on said first plate, and the other of said pair of observation optical systems is placed on said second plate, so that the distance between the optical axes of said pair of observation optical systems is adjusted by changing the relative positions of said first and second plates.

8. (Original) An observation optical device according to claim 7, wherein said first and second plates are linearly moved relative to each other, so that the optical axes of said pair of observation optical systems are moved in a predetermined plane, whereby the distance between the optical axes of said pair of observation optical systems is changed.

STATEMENT OF SUBSTANCE OF INTERVIEW

Applicant wishes to express appreciation to Examiner Pritchett for the telephone interviews of June 2 and 13, 2005. During the interviews, Applicants' representative, Attorney William Boshnick, spoke to the Examiner concerning the rejected claims of the present invention.

Specifically, Attorney Boshnick explained to the Examiner's that a feature the present invention provides an observation/photographing optical device having an improved photographic focusing function. As a matter of background, Attorney Boshnick noted that in prior art observation/photographic devices, such as the applied YAMAZAKI reference (described in Applicants' specification at, *inter alia*, page 5, lines 7-12), having a focusing system linked to both the observation optical system and photographing optical system, and having an eyepiece wherein the diopter may be adjusted (to accommodate a user's lens prescription), there is a possibility of the photographing optical system being out of focus when the focusing system is adjusted by the user, even though it appears to the user that the object is in focus, since the diopter adjustment may erroneously influence the amount of focus adjustment provided by the user.

In an effort to address this potential problem in the prior art, Attorney Boshnick explained, Applicants endeavored to provide a system wherein focusing error of the photographing optical system is substantially reduced or eliminated by compensating for this potential error caused by eyepiece diopter adjustment, such that, when an image observed through the observation optical system is focused, the image obtained by the photographic optical system is also focused. Attorney Boshnick noted that beginning on pages 35, line 4 of the present specification, the Applicants conducted a focusing test to determine where an observer's eyes focus in comparison to the in-focus

position of the test binoculars, and it was unexpectedly determined that the “observer’s eyes focus on the object image at a position slightly offset from the in-focus position.” Attorney Boshnick explained that Fig. 12 of the present application shows the measurement results of this focusing test, which allowed the inventors to obtain the arithmetic mean of the measured dioptric differences. Taking this mean into consideration, Attorney Boshnick explained, the inventors were able to modify (as a non-limiting example) a cam groove 75 (shown in Fig. 13), which results in a measured dioptric power difference between a first dioptric power of a combination of an eye of the user and an ocular lens system of the observation optical system, and a second dioptric power of a combination of the eye and the ocular lens system and an objective lens system of the observation optical system, being cancelled, in contrast to the cam groove of Fig. 9, which does not take these measured dioptric differences into account.¹ Thus, Attorney Boshnick further explained, the present claimed invention provides that when an image observed through the observation optical system is focused on the reticle, the image obtained by the photographic optical system is also focused.

With respect to the limitation “the photographing optical system is positioned at an object side, in relation to a theoretical position determined when the photographing optical system focuses on an object, when said observation optical system focuses on the object,” the Examiner indicated that this limitation seemed somewhat unclear. While Attorney Boshnick noted that this limitation is clear to one skilled in the art and is clearly explained further in, *e.g.*, page 37, lines 12-20, and that the corresponding structure was already sufficiently and clearly recited in this claim, it was agreed to clarify this phrase in claim 1 by reciting, *e.g.*, that the photographic optical system is also focused,

¹ As noted on page 37, lines 9-11, the broken line of the helicoid cam groove 75 shown in Fig. 13 corresponds to that shown in Fig. 9

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solely in order to expedite the patent application process and without agreeing to the propriety of the Examiner's rejection, even though this claim already substantially recites that the second focusing mechanism that focuses the photographing optical system is "constructed in such a manner that a measured dioptric power difference . . . is canceled." The Examiner agreed that such a clarification appeared to overcome the applied YAMAZAKI reference.